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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/660,565

09/12/2003

Howard Rhodes

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5308

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EXAMINER

ARENA, ANDREW OWENS

ART UNIT

PAPER NUMBER

2811

NOTIFICATION DATE

DELIVERY MODE

07/09/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

Office Action Summary	Application No. 10/660,565	Applicant(s) RHODES ET AL.	
	Examiner Andrew O. Arena	Art Unit 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 April 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 90,93-125 and 128-141 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 90,93-125 and 128-136 is/are allowed.
- 6) ☒ Claim(s) 137-141 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>APR 25 2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

Claims 137-141 are rejected under 35 U.S.C. 103(a) as being obvious in view of Rhodes (US 6,204,524) and Lauxtermann (US 2001/0015831).

RE claim 137, Rhodes discloses (Fig 6-14) a method of forming an imager (col 8 ln 28-30) comprising the steps of:

providing a semiconductor substrate (116+120; col 8 ln 30-32) having a doped layer (120) of a first conductivity type (col 8 ln 32-33);

forming a field oxide region (115; col 7 ln 25-28) in said semiconductor substrate;

forming a photosensor (Fig 5: 125, col 7 ln 36-37; col 8 ln 45 – col 9 ln 25) including a charge collection region (region of 155/110/126) of a second conductivity type (col 7 ln 31-33), said charge collection region being provided in said doped layer (col 7 ln 30-31), said charge collection region being adjacent one side (left) of a gate of a pixel transistor (128; col 7 ln 37-38);

forming a floating diffusion region (130; col 7 ln 41-43, col 9 ln 8-17) for receiving charge (accumulated: col 7 ln 46-48) from said charge collection region (by way of transfer transistor 128: col 7 ln 37-38), said floating diffusion region being connected to said gate of said pixel transistor (128) and being adjacent another side (right) of said gate (of 128) opposite said charge collection region (155/110/126); and

directly connecting an electrode (156) of a {second} charge storage capacitor (Fig 5: 162; col 9 ln 36-37) to said charge collection region (at 155) by a {second} electrical contact (150; col 7 ln 61-64).

Rhodes differs from the claimed invention only in not disclosing “connecting an electrode of a first charge storage capacitor to said floating diffusion region.”

Lauxtermann discloses (Fig 2B) an analogous CMOS imager (¶1) comprising: a photosensor (PD; ¶6 In 5) and a floating (no fixed potential) diffusion region (55; ¶7 In 6) for receiving charge from said photosensor (¶6 In 7-11) adjacent opposite sides of a gate of a pixel transistor (M2; ¶8 In 3); and one electrode of a charge storage capacitor (C1; ¶6 In 10-11) is connected directly to said floating diffusion region by an electrical contact to allow separation of the detection and reading processes (¶6 In 17-19).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Rhodes in view of Lauxtermann by forming a first charge storage capacitor over said semiconductor substrate using the method taught by Rhodes and then connecting an electrode of said first charge storage capacitor to said floating diffusion region by a first electrical contact; at least to allow separation of the detection and reading processes.

The combination of Rhodes and Lauxtermann arguably differs from the claimed invention only in not explicitly teaching the spatial arrangement of said first capacitor.

Rhodes teaches a method (Fig 10-14) of forming a capacitor (162) on top of an insulating layer (106) such that the capacitor lies entirely above - hence it partly overlies – the field oxide region (115). It would be obvious to form both capacitors this way.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made that said first charge storage capacitor is formed to partly overly said field oxide region; at least to use a known suitable method.

RE claim 138, Rhodes as modified discloses said first charge storage capacitor is formed such that the extent of said charge storage capacitor overlies said field oxide region (no portion lies under 115).

RE claim 139, Rhodes as modified discloses a first portion of said first charge storage capacitor is formed over said field oxide region (no portion lies under 115), and a second portion of said first charge storage capacitor is formed over an active area of said photosensor (no portion lies under 125).

RE claim 140, Rhodes as modified discloses said second charge storage capacitor is formed such that the extent of said charge storage capacitor overlies said field oxide region (no portion lies under 115).

RE claim 141, Rhodes as modified discloses a first portion of said second charge storage capacitor is formed over said field oxide region (no portion lies under 115), and a second portion of said second charge storage capacitor is formed over an active area of said photosensor (no portion lies under 125).

Response to Arguments

The arguments filed 04/04/2008 regarding claims 137-141 have been fully considered but are not persuasive.

The current claim language “formed to partly overly said field oxide region” must be given the broadest reasonable interpretation consistent with the instant specification and encompasses any capacitor which is at least partly vertically above the field oxide.

Allowable Subject Matter

Claims 90, 93-125 and 128-136 are allowed.

Allowable subject matter has been indicated because the references of record, alone or in combination, do not teach or fairly suggest the following limitations:

the entire extent of said charge storage capacitor is within said lateral boundaries of said field oxide region, as required by claims 90, 93-121 and 130-136; or

the other electrode of said storage capacitor is connected directly to a gate of another transistor, as required by claims 122-125, 128 and 129.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Art Unit: 2811

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew O. Arena whose telephone number is (571)272-5976. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne A. Gurley can be reached on 571- 272-1670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. For more info about PAIR, see <http://pair-direct.uspto.gov>. For questions PAIR access, contact the Electronic Business Center at 866-217-9197 (toll-free). For assistance from a USPTO Customer Service Rep or access to the automated info system, call 800-786-9199 or 571-272-1000.

/Andrew O. Arena/
Examiner, Art Unit 2811
26 June 2008

/Lynne A. Gurley/
Supervisory Patent Examiner, Art
Unit 2811